

Edited Work & Energy Worksheets – All Classes

Period 7 Group 2

1. When Maddie walked by Tess, she accidentally kicked her backpack and gave it some initial velocity. Her backpack weighed 5 kg and traveled a distance of 2 m before coming to rest. ($F_f = 5 \text{ N}$) What is the initial velocity of the backpack?
2. Bob walks onto a diving board that is .5 m long. Bob weighs 95 kg and his initial stance on the board causes the springs to be compressed at 40 m. $K = 150 \text{ NM}$. What is Bob's max height when he jumps off the diving board?
3. Mary hits a tennis ball off the court and it begins to roll down Melville (10 m) at 6 m/s. The tennis ball weighs .08 kg. What is the velocity of the tennis ball at the bottom of Melville?

Period 7 Group 4

1. A car is moving at the top of a hill, the car weighs 1500 kilograms and the hill is 21 meters high. The velocity of the car on top of the hill is 5 meters per second. What is the velocity at the bottom of the hill?
2. A 6kg box is sitting on top of a spring. The spring is being compressed 2m. If the box is moved, find the height of the spring when it is not compressed. $K = 75 \text{ nm}$
3. A 14kg box is being pushed at 7 meters per second. It is pushed 1.5 meters and the force of friction is 18N. Find the final velocity of the box.

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Period 7 Group 3

1. A 5 kg weight is pressed down on a spring ($k = 82$ and $x = .6$ m). What is the max height that the weight will reach? What is the total mechanical energy of the system?
2. A 100 kg weight is pushed and is moving at an initial velocity of 3.3 m/s. The force of friction is 20 N. What is the final velocity after the weight moves 13 m? How much work is being done?
3. A 300 kg car is travelling at a rate of 7.2 m/s, and is about to drive down a hill that is 25 m long. The total force exerted to speed up is 50 N down the hill, and the total mechanical energy is 80000 J. What is the kinetic energy at the top of the hill and the bottom of the hill?

Period 7 Group 1

1. A spring ($k=200\text{N/m}$) is compressed 0.7m and has a box on top of it that weighs 15 kg, when it is sprung from the spring what is the maximum height it reaches?
2. A person weighing 60 kg jumps on a trampoline, first compressing it (the trampoline spring) 0.5m and then reaching a max height of 2m above the surface of the trampoline. What is k of the spring?
3. A mass weighing 12 kg is pushed 3 m over a surface with a friction force of 13N and a velocity of 10m/s, what is the velocity after the mass has crossed the three meters?

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Period 4 Group 1

1. A 3 kg object is placed on a spring. How high does the object go when the spring is released if $x=1$ and $k=60\text{N/m}$

2. A 10 kg object is moving upward at a speed of 15 m/s. It is currently 6.8m above the ground. Find the Kinetic, Potential, and Mechanical Energy of the object.

3. A 5 kg object is initially stationary and then moved with a force of 15N. Find the amount of work done on the object if it is pushed for 1 m. Find the initial and final mechanical energy as well as the final velocity.

Period 4 Group 2

1. Calculate the gravitational potential energy of a skydiver with a mass of 72.7 kg about to jump out of a plane at an altitude of 10,598 meters. If the skydiver's parachute fails to open, what would be his/her velocity as they hit the ground?

2. Suppose you place a 3 kg block on top of a spring. Find the potential energy of the spring where $K=30.67$ and $X=30.5$. If the spring were to release its energy, how high into the air would the block be launched?

3. What is the work of a car that weighs 1818.452 kg that is moved 14 m by an applied force of 2000N? At the end of its acceleration, what will be the car's final velocity? Assume it starts from rest. **Formula:** $W=(f)(d)(\cos(\theta))$.

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Period 4 Group 4

1. A 15 kg object is dropped from a 200m cliff and it is moving downward at a speed of 17m/s.
 - a. Find its kinetic energy

 - b. Find its potential energy

 - c. Find its mechanical energy

 - d. What is its velocity when it reaches the bottom.

2. A 2kg marble is rolled with an initial speed of 6m/s and hits a spring. The constant of the spring is 200nm. How much does the spring compress?

3. A box with a mass of 80kg is pushed 7m with a force of 200N.
 - a. Calculate the work that was done on the box

 - b. What is the final velocity of the box.

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Period 4 Group 3

1. A 25 kg object is thrown from the ground onto the roof of a building at an initial velocity of 10 m/s. It travels a total of 5.1 m up until it reaches the roof and stops. Find the initial kinetic energy, the final gravitational potential energy and work the person had to do for the object to reach the roof.
2. A 82 kg mountain goat is climbing a 100 m mountain but it stepped on a wrong spot and now it's falling. What is the gravitational potential energy when it was climbing the mountain and what is velocity when it hits the ground also what is the mechanical energy? (It survived!)
3. Someone is riding their bike up a hill at a velocity of 3 m/s, the person and their bike are a total of 90 kg. They travel a total of 75 m until they reach the top of the hill, still traveling at 3m/s. Calculate the initial mechanical energy, the final mechanical energy, and the work the person had to do to reach the top of the hill.